

REMARKS

The present communication is in response to the Office Action dated December 8, 2009. Claims 1-33 are now present in this case. In this communication, none of the claims have been amended, and new claims 34 and 35 have been added. For at least the reasons presented below, reconsideration and full allowance are respectfully requested.

Rejection of claims under 35 U.S.C. § 103

Claims 1-33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,574,504 issued to Mazaury et al ("Mazaury"). Applicant maintains that Mazaury does not teach or suggest multiple features of the subject matter claimed in claims 1-33.

In general, the present invention is directed to a method and apparatus for facilitating transdermal deliver of therapeutic substances such as drugs, vaccines, ions, macromolecules, DNA fragments, genes, or the like. To accomplish this function, a control device may be coupled to an electromagnetic field generative device to alternatively produce active and substantially inactive electromagnetic field portions, wherein the active field portions include packets having a plurality of successive electromagnetic field pulses. Additionally, to provide improved transdermal delivery, the time between successive electromagnetic field packets is greater than the time between successive electromagnetic field pulses. As provided in various dependent claims, the method and apparatus may employ a solid state switching device to energize a coil with current to produce a magnetic field in a low frequency region (e.g., about 1 Hz to about 100 Hz). By energizing the coil independently from any circuit resonance, characteristics of the magnetic field including pulse shape, duration and duty cycle may be elected, as well as packet and repetition rate, such that a desired energization signal pattern may be chosen for a particular application.

Corresponding subject matter is set forth in independent claims 1 and 19 and various dependent claims. For example, claim 1 discloses an active electromagnetic field portion that includes an electromagnetic field packet having a plurality of successive electromagnetic field pulses. Further, claim 1 discloses that the time

between successive electromagnetic field packets is greater than the time between successive electromagnetic pulses. See e.g., Fig. 3 of the present application, which shows two energization signal packets 20 separated by an inactive signal portion 21, wherein the time between the packets 20 (i.e., the inactive signal portion 21) is greater than the time between successive electromagnetic pulses of the individual packets 20.

Conversely, Mazaury teaches the use of a high frequency (between 1 MHz and 300 MHz, see col. 1, lines 56-57 of Mazaury) device, employing an antenna circuit in the form of a standard RF free running oscillator. Such oscillator circuits produce AC fields that have only a sinusoidal pulse shape, and may only be turned on and off by the application of power. That is, the free running nature of such self oscillating circuits makes alterations to the pulse shape, output type (electric fields rather than magnetic), and duty cycle unachievable.

In addition to the above, Mazaury does not teach the use of a coil (no reference to that term appears in the application) as provided in claims 5 and 22, and refers exclusively to an antenna, a common device used to form a free running oscillator capable of producing a single frequency of oscillation in the RF range and in the form of an AC sinusoidal output. One skilled in the art would recognize that the apparatus described in Mazaury would not be able to produce substantially rectangularly shaped magnetic fields as disclosed in dependent claims 4 and 21 of the present invention.

Although Mazaury does teach a self running oscillator that may be turned on and off at predetermined periods to provide alternating delivery of RF frequencies, this process is not capable of producing the type of frequency pulses specified by the present invention. For example, Mazaury is silent regarding the active portion being different from the inactive portion as the device taught by the '504 patent is not capable of such freedom of use.

Furthermore, although the free running oscillator and antenna circuitry of Mazaury can be switched on and off, it does not do so using a solid state switching device as provided by several dependent claims of the present invention (e.g., claims 2 and 20 and claims that depend therefrom). The switching of Mazaury is substantially different in both form and function from the use of a solid state switching device for the purpose of providing energy to a coil for the production of a magnetic field, as provided

for in multiple dependent claims of the present invention. Those skilled in the art will be aware that the two processes are distinctly different and that, as described above, an RF oscillator as described by Mazaury cannot be used to produce quasi-rectangular magnetic field pulses.

Further, Mazaury is silent with regard to packets of frequency pulses and duration of individual pulses, both of which are provided in the independent claims. This is not surprising since a free running oscillator as described by Mazaury is incapable of such functionality. In contrast, embodiments of the present invention use current to energize a coil. In these embodiments, the frequency of operation may be determined by a solid state switching device, not the coil itself as is the case with a free running oscillator. Additionally, the number of substantially rectangular pulses within a time period (i.e., the frequency) is determined by use of a control device, as are the active and inactive periods. As Mazaury uses a free running oscillator, it is simply not possible to vary these parameters as they are determined by the resonant frequency of the RF oscillator circuit.

The disclosure of Mazaury also teaches that it is essential to maintain a separation distance of "at least 50cm" between the antennae and the "zone to be treated" (i.e., the skin) (see col. 3, lines 49-64 of Mazaury). This separation requirement is necessary in the invention of Mazaury as it is an RF free running oscillator device producing AC electrical fields. Such fields could be injurious to humans if allowed to come in contract with the skin. In contrast, the magnetic fields of the present invention do not in any way harm the skin during application.

Accordingly, as the disclosure of Mazaury simply does not teach or suggest several elements present in the claimed invention, Applicant respectfully asserts that claims 1-33 are patentable over Mazaury, and requests that this rejection be withdrawn.

New claims 34-35

In this response, Applicant has added new claims 34 and 35, which are believed to be patentable over Mazaury for at least the reasons set forth above in relation to claims 1-33.

Conclusion

Payment of \$104.00 is included as the claim fee for the newly added claims. If additional fees are believed necessary, the Commissioner is authorized to charge any deficiency or credit any overpayment to Deposit Account No. 04-0258 of Davis Wright Tremaine LLP.

All of the claims remaining in the application are now believed to be allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

If questions remain regarding this application, the Examiner is invited to contact the undersigned at (206) 757-8133.

Respectfully submitted,
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